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THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: KAMBE, Toshio et al.

Serial No.: 09/960,727

Filed: September 24, 2001

2004 APR 23 PM 3:19
ATTN: Refund Section
Accounting Division
Office of Finance

Group Art Unit: 1724

Examiner: Betsey Morrison Hoey

For: APPARATUS AND METHOD FOR CONTROLLING RESISTIVITY
OF ULTRA PURE WATER

P.T.O. Confirmation No.: 4209

REQUEST FOR REFUND

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: April 21, 2004

Sir:

This is a request for a refund with respect to the charge to Deposit Account 01-2340 dated March 23, 2004 (Control No. 1251) for the above-identified patent application. A copy of the monthly statement dated March, 2004, in which the error referred to occurs, accompanies this request.

The amount of the refund requested is \$110.00 for the Petition for Extension of Time for one month for a total refund requested of \$110.00.

In response to the Office Action dated March 29, 2004, an Amendment was timely filed on March 17, 2004. A copy of the Amendment and the stamped postcard are enclosed herewith.

Adjustment date: 05/05/2004 EER/BOY1
03/23/2004 NWAG/STAF 00000001 012340 09960727
01 FC:1251 110.00 CR

STATUS AND ENTITY
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U.S. Appln. Ser. No. 09/960,727
Request for Refund filed April 21, 2004
2004 APR 23 PM 3:19

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Please make the refund by crediting Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP

Nicholas S. Bromer
Nicholas S. Bromer
Attorney for Applicant
Reg. No. 33,478

NSB/alw
Atty. Docket No. 011283
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930

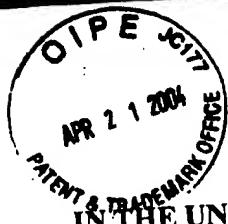


23850

PATENT TRADEMARK OFFICE

Enclosures: Monthly Statement of March, 2004
Copy of Amendment dated March 17, 2004
Copy of stamped postcard

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

STATUS AND ENT.
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204 APR 23 PM 3:

In re the Application of: KAMBE, Toshio et al.

Group Art Unit: 1724

Serial No.: 09/960,727

Examiner: Betsey Morrison Hoey

Filed: September 24, 2001

P.T.O. Confirmation No.: 4209

For: APPARATUS AND METHOD FOR CONTROLLING RESISTIVITY OF ULTRA
PURE WATER

AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 17, 2004

Sir:

Claims 1 and 2 were rejected as anticipated, but are now amended to overcome the prior art, as was discussed at the personal interview of March 9. The Examiner indicated that the present amendments would put the application into condition for allowance. Support for the present amendment in the specification is as noted on the Interview Summary.

The Applicants' required statement of the substance of the interview is: It was agreed to incorporate a mixed gas supply limitation into claims 1 and 2. A mixed gas is defined in the specification on page 5, and support for a mixed gas supply is given on page 14.

This paper is in response to the Office Action mailed on December 29, 2003.

No extension fee is due. However, any fees needed for this paper may be charged to Deposit Account No. 01-2340 and, in the event this paper is not timely filed, then consider this paper as a petition for an appropriate extension of time.

STATUS AND ENTRY

Serial No. 09/960,727; Reply to OA of December 29, 2003

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IN THE CLAIMS:

1. (currently amended): An apparatus for controlling resistivity of ultra pure water, comprising:

a mixed gas supply:

a housing to house a gas permeable membrane, the gas permeable membrane dividing the interior of the housing into an ultra pure water path and a mixed gas path wherein a mixed gas from the mixed gas supply, selected from the group consisting of a mixed gas comprising carbon dioxide and a gas having a lower resistivity controlling ability than carbon dioxide and a mixed gas comprising ammonia and a gas having a lower resistivity controlling ability than ammonia, passes the mixed gas path, and the housing has an opening for supplying the mixed gas through which the mixed gas path communicates with the exterior of the housing;

an inlet for untreated ultra pure water which communicates with the ultra pure water path;

and

an outlet for resistivity-controlled ultra pure water which communicates with the ultra pure water path, wherein

the gas permeable membrane is capable of supplying carbon dioxide or ammonia to the untreated ultra pure water which passes through the ultra pure water path at a concentration equal to or more than 90% of the equilibrium concentration.

2. (currently amended): An apparatus for controlling resistivity of ultra pure water, comprising:

a mixed gas supply:

a membrane module having a gas permeable membrane, the membrane module being capable of supplying carbon dioxide or ammonia to untreated ultra pure water so that the concentration of carbon dioxide or ammonia in the ultra pure water becomes equal to or more than 90% of the equilibrium concentration within an expected fluctuation range of the flow rate of the untreated ultra pure water, and

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a unit which produces ultra pure water in which carbon dioxide gas or ammonia has been dissolved in a sufficient amount to obtain a desired resistivity at any flow rate of the ultra pure water supplied, by contacting the ultra pure water with a mixed gas from the mixed gas supply, selected from the group consisting of a mixed gas comprising carbon dioxide and a gas having a lower resistivity controlling ability than carbon dioxide and a mixed gas comprising ammonia and a gas having a lower resistivity controlling ability than ammonia, via the gas permeable membrane.

3. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 2, further comprising:

a housing to house the membrane module having the gas permeable membrane; and
a valve for maintaining a constant pressure of the mixed gas.

4. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 3, wherein

the membrane module, which is capable of producing ultra pure water in which carbon dioxide or ammonia is dissolved, is a hollow-fiber membrane module.

5. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 4, wherein

the hollow-fiber membrane module is of an internal water-flow type comprising a housing and a bundle of a plurality of hollow fiber membranes housed in the housing, in which the mixed gas is injected into a space between the exterior of the hollow-fiber membranes and the housing, and in which the ultra pure water flows inside the hollow-fiber membranes.

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6. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 4, wherein

the hollow-fiber membrane module is of an external water-flow type comprising a housing and a bundle of a plurality of hollow fiber membranes housed in the housing, in which the mixed gas is injected inside the hollow fiber membranes, and in which the ultra pure water flows in a space between the exterior of the hollow-fiber membranes and the housing.

7. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 5, further comprising a device which maintains a constant flow rate of the mixed gas.

8. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 6, further comprising a device which maintains a constant flow rate of the mixed gas.

9. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 5, further comprising a device which produces the mixed gas.

10. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 6, further comprising a device which produces the mixed gas.

11. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 5, wherein the mixed gas is air.

12. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 6, wherein the mixed gas is air.

13. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 7, wherein the mixed gas is air.

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14. (original): An apparatus for controlling resistivity of ultra pure water according to

Claim 8, wherein the mixed gas is air.

15. (original): A method for controlling resistivity of ultra pure water, comprising the steps of:

supplying a mixed gas, selected from the group consisting of a mixed gas comprising carbon dioxide and a gas having a lower resistivity controlling ability than carbon dioxide and a mixed gas comprising ammonia and a gas having a lower resistivity controlling ability than ammonia, to a flow of ultra pure water via a gas permeable membrane; and

producing resistivity-controlled ultra pure water by dissolving carbon dioxide or ammonia in the ultra pure water to a concentration equal to or more than 90% of the equilibrium concentration which is determined by the concentration of carbon dioxide or ammonia in the mixed gas, the partial pressure of carbon dioxide or ammonia in the mixed gas, and the temperature of the ultra pure water.

16. (original): A method for controlling resistivity of ultra pure water, comprising the step of:

contacting ultra pure water with a mixed gas, selected from the group consisting of a mixed gas comprising carbon dioxide and a gas having a lower resistivity controlling ability than carbon dioxide and a mixed gas comprising ammonia and a gas having a lower resistivity controlling ability than ammonia, via a membrane module having a gas permeable membrane, the membrane module being capable of supplying carbon dioxide or ammonia to the ultra pure water so that the concentration of carbon dioxide or ammonia in the ultra pure water becomes equal to or more than 90% of the equilibrium concentration within an expected fluctuation range of the flow rate of the untreated ultra pure water, whereby resistivity-controlled ultra pure water is produced in which carbon dioxide gas or ammonia has been dissolved in a sufficient amount to obtain a desired resistivity at any flow rate of the ultra pure water supplied.

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17. (original): A method for controlling resistivity of ultra pure water according to Claim 15, wherein air is used as the mixed gas.

18. (original): A method for controlling resistivity of ultra pure water according to Claim 16, wherein air is used as the mixed gas.

19. (original): A method for controlling resistivity of ultra pure water, comprising:
flowing water to the membrane module of the apparatus for controlling resistivity of
ultra pure water according to Claim 2.

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REMARKS

Entry and allowance are solicited.

Respectfully submitted,

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CARD NO: 08303

U.S. Patent Application Docket No: 011283
Serial No: 09/960,727 Filed: 09/24/01
Patent Number: Issued:
Applicant(s): KAMBE, Toshio et al.

Papers filed herewith on: 03/17/04

Amendment

STATUS AND ENTITY
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Z004 APR 23 PM 3:20



COMMISSIONER OF PATENTS

Receipt is hereby acknowledged of the papers filed as indicated
in connection with the above-identified case.

NSB/SC

Deposit Account Statement

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United States
Patent and
Trademark Office



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4/14/04

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Requested Statement Month: March 2004
 Deposit Account Number: 012340
 Name: ARMSTRONG,KRATZ,QUINTOS,HANSON & BROOKS LLP
 Attention: CHRISTINE LEE
 Address: 1725 K STREET, NW
 City: WASHINGTON
 State: DC
 Zip: 20006

DATE	SEQ	POSTING REF	ATTORNEY DOCKET NBR	FEE CODE	AMT	BAL
03/03	34	10469988	031134 1102-333 8021		\$40.00	\$9,631.36 B
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03/19	3	10206353	001483A 3743-031	1252	\$420.00	\$13,708.36 ✓

Deposit Account Statement

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03/23 17	10670245 WHO	0311983553-121	1051	\$130.00	\$11,582.36
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START BALANCE	SUM OF CHARGES	SUM OF REPLENISH	END BALANCE
\$9,671.36	\$12,209.00		\$12,414.00 \$9,876.36

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